DATE: September 9, 1982

TO: Division File

FROM: Tim Greetis TG

SUBJECT: Brighton/Brighton #1 and #2 -- 11780201 and 11780203

Note: This memo is a supplement to the previous memo of August 2, 1982 under the same title.

Results of the thirteen split spoon samples and the three shelby tube samples have been returned from Soil Testing Services in Peoria. The split spoon samples were analyzed for sieve analysis and hydrometer analysis while the shelby tube samples were analyzed for those and permeability. A copy of the results are included with this memo. For the sake of textural classifications, on Table 1 is the classification name using the United States Department of Agriculture (USDA) System and the Shepard System. The acknowledgement of both systems are due to the permit requirement of samples being classified using the USDA System and the IEPA, specifically the Drill Rig Unit using Shepard.

Using the USDA System triangle, if the gravel content was less than 20 percent. it was omitted from the textural classification name. If the percentage of gravel was between 20 and 50, then the adjective modifier used was the term gravelly. In contrast, using the sand-silt-clay triangle of the Shepard System, the gravel was used as an adjective modifier if the percentage of gravel was less than 15 percent and/or the percentage of gravel was less than that of clay. If the gravel was greater than 15 percent, then the gravel-sand-silt triangle was used with the clay being used as the adjective modifier. In either classification system case, the percentages of each material was recalculated to equal 100 total percent of sample minus the least dominant material. This was done so that an accurate plotting of percentages could be performed on the appropriate triangle.

The permeability of the three shelby tube samples (ST-1, ST-2, ST-3) range from 5.4×10^{-7} to 3.8×10^{-4}. After a lengthy review of all the sieve analysis, it appears that there exists soils which have both a lower and higher permeability than those that were analyzed. Also, as one could see from the samples analyzed, there exists a high percentage of sand which would indicate that the potential for groundwater contamination to migrate off-site is possible if contamination does indeed exist. This introduces a clarification to the previous memo which concerns the possibility of a continuous shallow sand unit. The clarification is that a shallow sand was discovered and found to exist in each of the IEPA borings which may indicate that sand unit could be continuous but the Mathes borings chose to omit mentioning it.

In conclusion, from the sample analyses done by Soil Testing Services, it is evident that **an abundant amount of sand with possibly moderate to high permeability is located at this site.** The soil classifications provided on the boring logs were the field descriptions and could vary from the actual laboratory analysis. The field classifications were performed by using the Shepard System and thus should be compared with the Shepard System description on Table 1 of this memo. Whichever classification system is used, the percentage of sand in each sample collected is a very critical factor. On the contrary, this abundant sand could be misleading because there is a very tight glacial till clay below an elevation of approximately 600 MSL. But above this clay till are a number of small sand layers which could potentially cause the site numerous groundwater problems if left unattended.

TG:mad/11

Attachment

Table 1
Textural Classifications

Sample	Shepard	USDA
B-1 S-3	Silty Clayey Sand w/trace gravel	Sandy Clay Loam
B-1 S-4 top	Silty Sand w/little gravel	Sandy Loam
B-1 ST-1	Silty Sand w/trace gravel	Sandy [illegible] Loam
B-2 S-5	Silty Sand w/trace gravel	Loam
B-2 S-6	Silty Sand w/little gravel	Sandy Loam
B-2 S-7 top	Silty Sand w/trace gravel	Sandy Loam
B-2 S-8 top	Silty Sand w/trace clay	Sandy Loam
B-3 S-6	Silty Sand w/some clay	Sandy Loam
B-3 S-8	Gravelly Sand w/trace clay	Gravelly Sandy Loam
B-3 S-9	Gravelly Sand w/trace clay	Gravelly Sand
B-3 S-10	Silty Sand w/little gravel	Sandy Loam
B-3 ST-2	Silty Sand w/little gravel	Sandy Loam
B-4 S-2 top	Silty Sand w/little gravel	Sandy Loam
B-4 S-2	Gravelly Sand w/trace clay	[illegible] Sand
B-4 S-5 top	Sand	Sand
B-4 ST-3	Sand	[illegible] Sand

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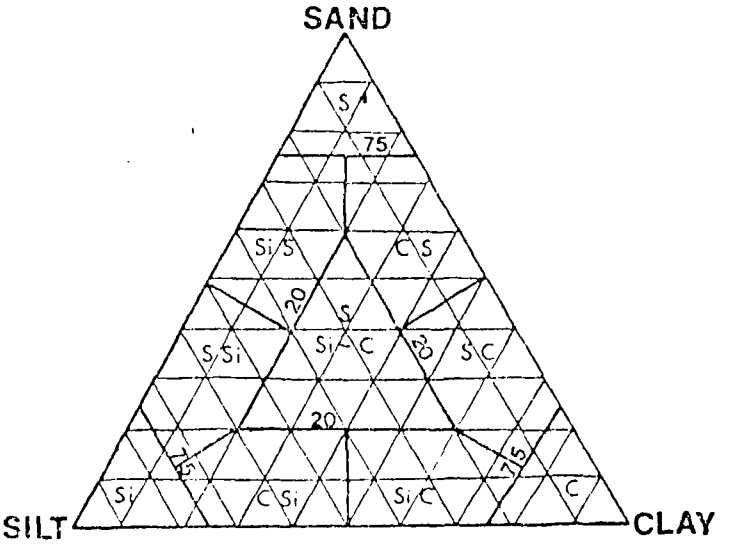
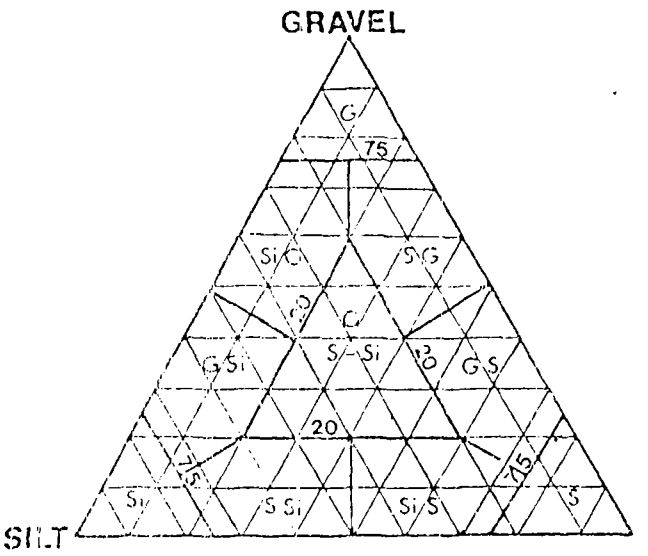
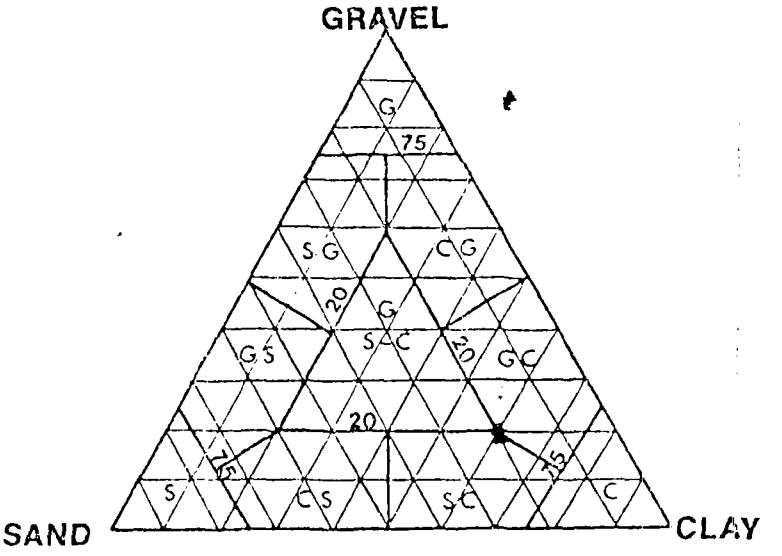


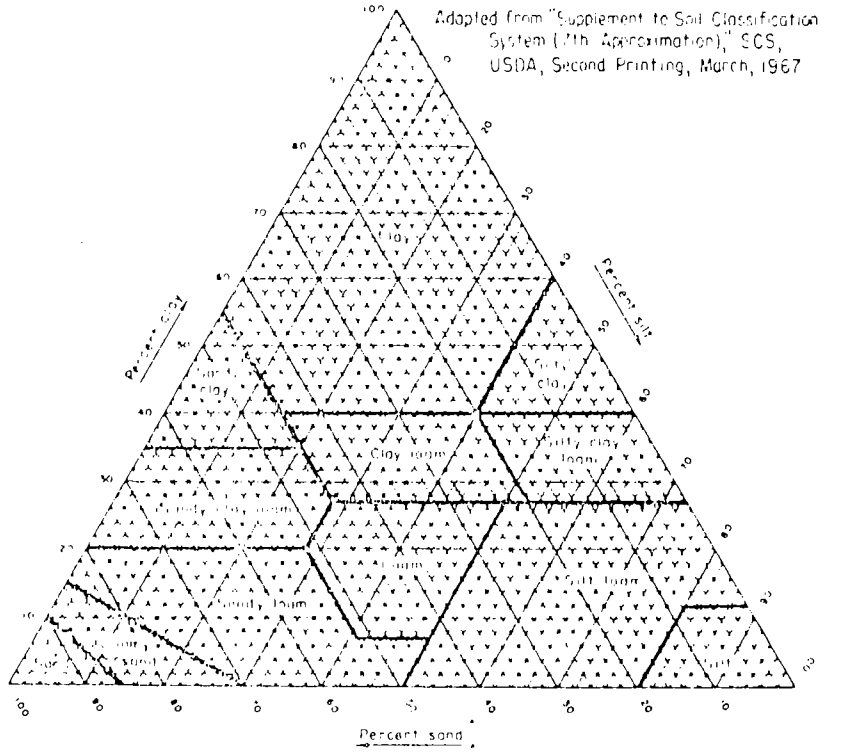




Percent grain size	Adjective modifiers for minor grain sizes*
>15%	Included in major textural class
10–15%	Some
5–10%	Little
< 5%	Trace

*Only applicable to wells bored by the IEPA

Textural triangles (adopted from Shepard, 1954) and terminology used for classification of unconsolidated deposits.



* Very fine sand (0.05 – 0.1) is treated as silt for family groupings, coarse fragments are considered the equivalent of coarse sand in the boundary between the silty and loamy classes

COMPARISON OF PARTICLE-SIZE SCALES

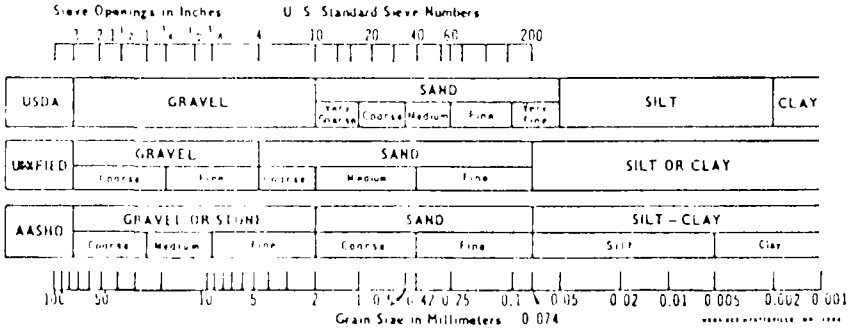


Figure 30.—Soil triangle of the basic soil textural classes. (U.S. Soil Conservation Service.) 288-D-2782.